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Signal waveform modulation system for CDMA cellular telephone system - generates high speed pseudo-noise modulation sequences to provide orthogonality between users using spread spectrum techniques

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Patent Family (63 patents, 37 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
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			EP 2001103642	A	20010222		
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Priority Applications (no., kind, date): US 1990543496 A 19900625; WO 1991US4400 A 19910621; US 1992825147 A 19920124; US 1992858781 A 19920327; US 1993156757 A 19931124; US 1995441894 A 19950516; US 1995441895 A 19950516; US 1999360059 A 19990723; US 2002263898 A 20021002; US 2004772490 A 20040205; US 2005297264 A 20051207

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes		
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National Designated	AU BG BR CA CS FI HU JP KP KR NO PL RO SU						

States,Original					
Regional Designated States,Original	AT BE CH DE DK ES FR GB GR IT LU NL SE				
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FI 199205812	A	FI		PCT Application	WO 1991US4400
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BR 199106592	A	PT		PCT Application	WO 1991US4400
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HU 216989	B	HU		PCT Application	WO 1991US4400
				Previously issued patent	HU 64657
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KR 134390	B1	KO		PCT Application	WO 1991US4400
JP 11317691	A	JA	40	Division of application	JP 1991514045
SK 281176	B6	SK		PCT Application	WO 1991US4400
				Previously issued patent	SK 9203871
EP 1104955	A1	EN		Division of application	EP 1991915727
				Division of patent	EP 536334
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				Based on OPI patent	WO 1992000639
CA 2360909	A1	EN		Division of application	CA 2085890
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				Related to application	EP 2001103642
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				Continuation of patent	US 5103459
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				Related to application	EP 200527505
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Regional Designated States,Original	AT BE CH DE DK ES FR GB GR IT LI LU NL SE
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Alerting Abstract WO A

An orthogonal sequence signal generated corresponding to an orthogonal binary sequence (Walsh sequence) is combined with a pseudo-noise (PN) signal corresponding to a predetermined augmented length maximal linear sequence PN code to provide a modulation signal. This is combined with an input information signal providing a spread spectrum information signal.

The signal is communicated between cell-site (12,14) and mobile units (16,18) with pilot, sync, paging and voice channels defined. Information is encoded, interleaved, BPSK modulated with orthogonal covering of each symbol along with QPSK spreading.

ADVANTAGE - Reduces mutual interference, gives higher capacity and better link performance. @ (77pp Dwg.No.1/15)

Equivalent Alerting Abstract US A

PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other.

Pref. signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signalling along with QPSK spreading.

USE - For communicating information signals using spread spectrum communication techniques.

Equivalent Alerting Abstract US A

PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. Pref signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols.

In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signalling along with QPSK spreading.

USE/ADVANTAGE - CDMA. System and method for communicating information signals using spread spectrum communication techniques, allowing higher capacity and better link performance.

Equivalent Alerting Abstract US A

A spread spectrum modulator comprises a convolutional encoder having an input receiving the frames of input digital data and an output, and a data interleaver having an input coupled to the convolutional encoder output and an output. A Walsh function encoder has an input coupled to the interleaver output and an output. A first exclusive-OR gate has a pair of inputs and an output, and one of the first exclusive-OR gate inputs is coupled

to the first pseudorandom noise (PN) code generator output and another of the first exclusive-OR gate inputs is coupled to the Walsh encoder output.

A second exclusive-OR gate has a pair of inputs and an output, and one of the second exclusive-OR gate inputs is coupled to the second PN code generator output and another of the second exclusive-OR gate inputs is coupled to the first exclusive-OR gate output. A third exclusive-OR gate has a pair of inputs and an output, and one of the third exclusive-OR gate inputs is coupled to the third PN code generator output and another of the third exclusive-OR gate inputs is coupled to the first exclusive-OR gate output.

ADVANTAGE - PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other.

Title Terms /Index Terms/Additional Words: SIGNAL; WAVEFORM; MODULATE; SYSTEM; CDMA; CELLULAR; TELEPHONE; GENERATE; HIGH; SPEED; PSEUDO; NOISE; SEQUENCE; ORTHOGONAL; USER; SPREAD; SPECTRUM; TECHNIQUE

Class Codes

International Patent Classification

IPC	Class Level	Scope	Position	Status	Version Date
H04B-001/707; H04J-013/00; H04L-027/30			Main		"Version 7"
H04B-007/26; H04L-023/02; H04L-005/02; H04L-005/12			Secondary		"Version 7"
H04B-0001/69	A	I	F	B	20060101
H04B-0001/69	A	I		R	20060101
H04B-0001/707	A	I	F	B	20060101
H04B-0001/707	A	I		R	20060101
H04B-0007/005	A	N		R	20060101
H04B-0007/26	A	I	L	B	20060101
H04B-0007/26	A	I		R	20060101
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H04J-0011/00	A	I		R	20060101
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H04J-0013/00	A	I	L	B	20060101
H04J-0013/00	A	I		R	20060101
H04J-0013/00	A	N		R	20060101
H04J-0013/02	A	I		R	20060101
H04J-0013/04	A	I	L	R	20060101
H04J-0003/00	A	I	L	B	20060101
H04J-0003/02	A	I		R	20060101
H04J-0003/16	A	I		R	20060101
H04J-0003/22	A	I		R	20060101
H04L-0001/00	A	I		R	20060101
H04L-0001/06	A	I		R	20060101
H04L-0001/08	A	N		R	20060101
H04L-0023/02	A	I		R	20060101
H04L-0027/08	A	I	L	B	20060101

H04L-0027/30	A	I	F	B	20060101
H04L-0027/30	A	I	L	R	20060101
H04L-0027/30	A	I		R	20060101
H04L-0005/02	A	I		R	20060101
H04L-0005/12	A	I		R	20060101
H04Q-0007/36	A	I		R	20060101
H04Q-0007/38	A	I	F	R	20060101
H04B-0007/26	A	I	L		20060101
H04J-0013/00	A	I	L		20060101
H04L-0027/30	A	I	F		20060101
H04B-0001/69	C	I		R	20060101
H04B-0001/707	C	I	L	B	20060101
H04B-0001/707	C	I		R	20060101
H04B-0007/005	C	N		R	20060101
H04B-0007/26	C	I	L	B	20060101
H04B-0007/26	C	I		R	20060101
H04J-0011/00	C	I	L	B	20060101
H04J-0011/00	C	I		R	20060101
H04J-0011/00	C	N		R	20060101
H04J-0013/00	C	I		R	20060101
H04J-0013/00	C	N		R	20060101
H04J-0013/02	C	I		R	20060101
H04J-0003/00	C	I	L	B	20060101
H04J-0003/02	C	I		R	20060101
H04J-0003/16	C	I		R	20060101
H04J-0003/22	C	I		R	20060101
H04L	S	I		R	20060101
H04L-0001/00	C	I		R	20060101
H04L-0001/02	C	I		R	20060101
H04L-0001/08	C	N		R	20060101
H04L-0023/00	C	I		R	20060101
H04L-0027/02	C	I	L	B	20060101
H04L-0027/26	C	I	F	B	20060101
H04L-0027/26	C	I	L	R	20060101
H04L-0027/26	C	I		R	20060101
H04L-0005/02	C	I		R	20060101
H04Q-0007/36	C	I		R	20060101
H04Q-0007/38	C	I	F	R	20060101
H04B-0001/707	C	I		B	20060101
H04B-0007/26	C	I			20060101
H04J-0013/00	C	I	L	B	20060101
H04J-0013/00	C	I			20060101
H04L-0027/26	C	I			20060101

US Classification, Issued: 375141000, 375150000, 375345000, 375150000, 375001000, 370018000, 370021000 , 370022000, 375068000, 379059000, 380034000, 455033100, 455054100, 375001000, 375068000, 380034000, 370018000, 370021000, 370022000, 379059000 , 455033100, 455054100,

375705000, 380034000, 370018000, 370021000, 370022000, 379059000, 455033100, 455054100, 370209000, 375206000, 375309000, 379059000, 380034000, 455033100, 455054100, 375200000, 375295000, 370208000, 370342000, 379059000, 380034000, 455033100, 455054100, 375200000, 370320000, 375295000, 375141000, 375140000, 375130000, 375150000, 375130000

File Segment: EPI;

DWPI Class: W01; W02

Manual Codes (EPI/S-X): W01-A03A; W01-A09D; W01-B05A1A; W02-C03C1A; W02-K08

Original Publication Data by Authority

Australia

Publication No. AU 652956 B (Update 199438 E)

Publication Date: 19940915

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

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VITERBI A J

Language: EN

Application: AU 199184016 A 19910621 (Local application)

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Related Publication: AU 9184016 A (Previously issued patent)

WO 1992000639 A (Based on OPI patent)

Original IPC: H04L-27/32(A) H04B-7/216(B)

Current IPC: H04B-1/707(R,A,J,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. AU 199184016 A (Update 199218 E)

Publication Date: 19920227

Assignee: QUALCOMM INC (QUAL-N)

Language: EN

Priority: US 1990543496 A 19900625

Original IPC: H04L-27/30(B)

Brazil

Publication No. BR 199106592 A (Update 199327 E)

Publication Date: 19930608

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

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WEAVER L A

WHEATLEY C E

VITERBI A J

Language: PT

Application: BR 199106592 A 19910621 (Local application)

WO 1991US4400 A 19910621 (PCT Application)

Priority: US 1990543496 A 19900625

Related Publication: WO 1992000639 A (Based on OPI patent)

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-

3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-

3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-

23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-

5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-

7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Canada

Publication No. CA 2085890 C (Update 200206 E)

Publication Date: 20020108

Language: EN

Application: CA 2085890 A 19910621 (Local application)

WO 1991US4400 A 19910621 (PCT Application)

Priority: US 1990543496 A 19900625

Related Publication: WO 1992000639 A (Based on OPI patent)

Original IPC: H04K-1/04(A) H04B-1/76(B) H04B-7/216(B) H04B-7/26(B) H04J-15/00(B) H04L-27/32(B)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. CA 2360909 A1 (Update 200210 E)

Publication Date: 19920109

Assignee: QUALCOMM INC (QUAL-N)

Inventor: PADOVANI R

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WEAVER L A

WHEATLEY C E

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Language: EN

Application: CA 2085890 A 19910621 (Division of application)

CA 2360909 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04B-1/69(A) H04Q-7/36(B)

Current IPC: H04B-1/69(R,A,I,M,EP,20060101,20051206,A) H04B-1/69(R,I,M,EP,20060101,20051206,C) H04Q-7/36(R,I,M,EP,20060101,20051206,A) H04Q-7/36(R,I,M,EP,20060101,20051206,C)

Publication No. CA 2360909 C (Update 200478 E)

Publication Date: 20041123

Assignee: QUALCOMM INC (QUAL-N)

Inventor: WEAVER L A

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Language: EN

Application: CA 2085890 A 19910621 (Division of application)

CA 2360909 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04B-1/69(A) H04Q-7/36(B)

Current IPC: H04B-1/69(R,A,I,M,EP,20060101,20051206,A) H04B-1/69(R,I,M,EP,20060101,20051206,C) H04Q-7/36(R,I,M,EP,20060101,20051206,A) H04Q-7/36(R,I,M,EP,20060101,20051206,C)

China

Publication No. CN 1057884 C (Update 200471 E)

Publication Date: 20001025

Assignee: QUALCOMM INC; US (QUAL-N)

Language: ZH

Application: CN 1991105315 A 19910625 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04J-13/00(A) H04B-7/26(B)

Current IPC: H04B-1/707(R,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. CN 1061312 A (Update 199305 E)

Publication Date: 19920520

Assignee: QUALCOMM INC; US (QUAL-N)

Inventor: GILHOUSEN K S

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PADOVANI R

Language: ZH

Application: CN 1991105315 A 19910625 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04J-13/00(A) H04B-7/26(B)

Current IPC: H04B-1/707(R,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Czech Republic

Publication No. CZ 283123 B6 (Update 199810 E)

Publication Date: 19980114

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

JACOBS I M

PADOVANI R

WEAVER L A

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VITERBI A J

Language: CS

Application: WO 1991US4400 A 19910621 (PCT Application)

CS 19923871 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Related Publication: CZ 9203871 A (Previously issued patent)

WO 1992000639 A (Based on OPI patent)

Original IPC: H04B-7/216(A) H04B-1/66(B) H04B-7/204(B) H04L-27/30(B)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-

3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-

3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-

23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-

5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-

7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. CZ 199203871 A3 (Update 199402 E)

Publication Date: 19931117

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

JACOBS I M

PADOVANI R

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Language: CS

Application: CS 19923871 A 19921223 (Local application)

Priority: US 1990543496 A 19900625

WO 1991US4400 A 19910621

Original IPC: H04L-27/30(A)

Current IPC: H04L(R,A,I,M,EP,20060101,20051206,S) H04L-27/26(R,I,M,EP,20060101,20051206,C)

H04L-27/30(R,I,M,EP,20060101,20051206,A)

Germany

Publication No. DE 69133017 E (Update 200250 E)

Publication Date: 20020627

Assignee: QUALCOMM INC; US (QUAL-N)

Language: DE

Application: DE 69133017 A 19910621 (Local application)

EP 1991915727 A 19910621 (Application)

WO 1991US4400 A 19910621 (PCT Application)

Priority: US 1990543496 A 19900625

Related Publication: EP 536334 A (Based on OPI patent)

WO 1992000639 A (Based on OPI patent)

Original IPC: H04L-27/30(A) H04B-7/26(B) H04J-13/00(B) H04L-5/02(B) H04L-5/12(B) H04L-23/02(B)

Current IPC: H04L-27/30(A) H04B-7/26(B) H04J-13/00(B) H04L-23/02(B) H04L-5/02(B) H04L-5/12(B)

Publication No. DE 69133394 E (Update 200446 E)

Publication Date: 20040715

Assignee: QUALCOMM INC; US (QUAL-N)

Language: DE

Application: DE 69133394 A 19910621 (Local application)

EP 2001103642 A 19910621 (Application)

Priority: US 1990543496 A 19900625

Related Publication: EP 1104955 A (Based on OPI patent)

Original IPC: H04B-1/707(A) H04B-7/26(B)

Current IPC: H04B-1/707(A) H04B-7/26(B)

Publication No. DE 69133394 T2 (Update 200540 E)

Publication Date: 20050616

Assignee: QUALCOMM INC; US (QUAL-N)

Inventor: GILHOUSEN K S

WEAVER

JACOBS I M

WHEATLEY

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VITERBI A J

Language: DE

Application: DE 69133394 A 19910621 (Local application)

EP 2001103642 A 19910621 (Application)

Priority: US 1990543496 A 19900625

Related Publication: EP 1104955 A (Based on OPI patent)

Original IPC: H04B-1/707(A) H04B-7/26(B)

Current IPC: H04B-1/707(A) H04B-7/26(B)

Publication No. DE 69133578 E (Update 200763 E)

Publication Date: 20070927

Assignee: QUALCOMM INC; US (QUAL-N)

Inventor: GILHOUSEN K S C O Q

WEAVER L A C O Q

JACOBS I M C O Q

Language: DE

Application: DE 69133578 A 19910621 (Local application)

EP 200412940 A 19910621 (Application)

Priority: US 1990543496 A 19900625

Related Publication: EP 1450531 A (Based on OPI patent)

Original IPC: H04B-7/26(I,DE,20060101,A,L) H04B-7/26(I,M,98,20060101,C) H04J-13/00(I,DE,20060101,A,L) H04J-13/00(I,M,98,20060101,C) H04L-27/26(I,M,98,20060101,C) H04L-27/30(I,DE,20060101,A,F)

Current IPC: H04B-7/26(I,DE,20060101,A,L) H04B-7/26(I,M,98,20060101,C) H04J-13/00(I,DE,20060101,A,L) H04J-13/00(I,M,98,20060101,C) H04L-27/26(I,M,98,20060101,C) H04L-27/30(I,DE,20060101,A,F)

EPO

Publication No. EP 1104955 A1 (Update 200133 E)

Publication Date: 20010606

Anordnung und Verfahren zur Erzeugung von Wellensignalen in einem zellularen CDMA Telefonsystem

System and method for generating signal waveforms in a CDMA cellular telephone system

Système et méthode pour generer des signaux de forme d'onde dans un système téléphonique cellulaire CDMA

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Munchen, DE

Language: EN

Application: EP 1991915727 A 19910621 (Division of application)

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Priority: US 1990543496 A 19900625

Related Publication: EP 536334 A (Division of patent)

Designated States: (Regional Original) AT BE CH DE DK ES FR GB GR IT LI LU NL SE

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H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04L-

1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-

1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-

5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C)

Original Abstract: SUMMARY OF THE INVENTION

- 1. A modulation system for use in spread spectrum communications, comprising:
 - means for generating a first orthogonal sequence signal corresponding to a selected one of a plurality of orthogonal binary sequences;
 - means for generating a pseudo-noise (PN) signal corresponding to a predetermined PN binary sequence;
 - means for combining said first orthogonal sequence signal and said PN signal and for providing a resultant first modulation signal.
- 2. The system of 1 further comprising additional means for combining said first modulation signal with an input information signal and for providing a resultant spread spectrum information signal.

- 3. The system of 1 wherein said plurality of orthogonal binary sequences are Walsh sequences.
- 4. The system of 1 wherein said PN sequence is an augmented length maximal linear sequence PN code.

Claim:

1. A modulation system for use in spread spectrum communications, the system comprising:
 - means (604) for generating an orthogonal sequence signal corresponding to a selected one of a plurality of orthogonal binary sequences, which means (604) is configured to receive an input signal and convert sequential portions of said input signal into respective ones of said orthogonal sequences selected from said plurality of orthogonal sequences according to a value of said respective input signal portion;
 - means (614, 616) for generating a pseudo-noise (PN) signal corresponding to a predetermined PN binary sequence; and
 - means (610, 612) for combining said orthogonal sequence signal, said PN signal and for providing a resultant signal.

Publication No. EP 1104955 B1 (Update 200438 E)

Publication Date: 20040609

Anordnung und Verfahren zur Erzeugung von Signalwellenformen in einem zellularen CDMA Telefonsystem

System and method for generating signal waveforms in a CDMA cellular telephone system
Systeme et methode pour generer des formes d'onde de signal dans un systeme telephonique cellulaire CDMA

Assignee: QUALCOMM Incorporated, 5775 Morehouse Drive, San Diego, California 92121-1714, US
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Wheatley, Charles E., III, 2208 Caminito Del Barco, Del Mar, CA 92014, US

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Viterbi, Andrew J., 2712 Glenwick Place, La Jolla, CA 92037, US

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Language: EN

Application: EP 1991915727 A 19910621 (Division of application)

EP 2001103642 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Related Publication: EP 536334 A (Division of patent)

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Original IPC: H04B-1/707(A) H04B-7/26(B)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04L-

1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-

1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-

5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C)

Claim:

1. Eine Mobileinheit zur Verwendung in einem Spreizspektrums-Kommunikationssystem, wobei die Mobileinheit Folgendes aufweist:

- Mittel (604) zum Generieren eines Orthogonalsequenzsignals, das einer aus einer Vielzahl von Orthogonalbinarsequenzen ausgewählten Sequenz entspricht;
- Mittel (614, 616) zum Generieren eines Pseudorausch-PN-Signals (pseudo-noise PN Signal) (PN_I, PN_Q) entsprechend einer vorbestimmten PN-Binarsequenz; und
- Mittel (610, 612) zum Kombinieren des Orthogonalsequenzsignals, des PN-Signals und zum Vorschen eines resultierenden bzw. Ergebnissignals, **dadurch gekennzeichnet, dass**
- die Mittel (604) zum Generieren eines Orthogonalsequenzsignals konfiguriert sind, um ein Eingabesignal zu empfangen, und sequentielle Teile des Eingabesignals in jeweils einzelne der Orthogonalbinarsequenzen, ausgewählt aus der Vielzahl von Orthogonalbinarsequenzen zu konvertieren, und zwar gemäß einem Wert des jeweiligen Eingabesignalteils;
- die vorbestimmte PN-Binarsequenz eine Sequenz ist, die allen Mobileinheiten in dem System zugewiesen ist; und
- Mittel (606, 608) vorgesehen sind zum Generieren eines zusätzlichen, vorbestimmten PN-Signals (PN_U), das für die Mobileinheit eigen- bzw. einzigartig ist, und zum Kombinieren des Orthogonalsequenzsignals mit dem zusätzlichen PN-Signal, um ein entsprechendes Mobileinheitsspreizsignal vorzusehen.

1. A mobile unit for use in a spread spectrum communication system, the mobile unit comprising:

- means (604) for generating an orthogonal sequence signal corresponding to a selected one of a plurality of orthogonal binary sequences;
- means (614, 616) for generating a pseudo-noise PN signal (PN_I, PN_Q) corresponding to a predetermined PN binary sequence; and
- means (610, 612) for combining said orthogonal sequence signal, said PN signal and for providing a resultant signal, **characterized in that:**
- said means (604) for generating an orthogonal sequence signal is configured to receive an input signal and convert sequential portions of said input signal into respective ones of said orthogonal binary sequences selected from said plurality of orthogonal binary sequences according to a value of said respective input signal portion;
- the predetermined PN binary sequence is a sequence assigned to all mobile units in the system; and
- means (606, 608) are provided for generating an additional predetermined PN signal (PN_U) unique to the mobile unit and combining said orthogonal sequence signal with said additional PN signal to produce a corresponding mobile unit spread signal.

1. Module mobile destine a etre utilise dans un systeme de communication a eteallement de spectre, le module mobile comprenant:

- des moyens (604) pour produire un signal de sequence orthogonale correspondant a l'une choisie de plusieurs sequences binaires orthogonales;
- des moyens (614, 616) pour produire un signal de pseudo-bruit PN (PN_I, PN_Q), correspondant a une sequence binaire PN predeterminee; et
- des moyens (610, 612) pour combiner le signal de sequence orthogonale, le signal PN, et pour fournir un signal resultant; **caracterise en ce que:**

- les moyens (604) pour produire un signal de sequence orthogonale sont configures pour recevoir un signal d'entree et convertir des parties sequentielles du signal d'entree en des sequences binaires orthogonales respectives choisies parmi la pluralite de sequences binaires orthogonales selon la valeur de la partie respective du signal d'entree;
- la sequence binaire PN predeterminee est une sequence affectee a tous les modules mobiles du systeme; et
- des moyens (606, 608) sont prevus pour produire un signal PN predetermine supplementaire (PN_U) specifique au module mobile et combiner le signal de sequence orthogonale avec le signal PN supplementaire pour produire un signal d'etalement de module mobile correspondant.

Publication No. EP 1450531 A2 (Update 200456 E)

Publication Date: 20040825

Anordnung und Verfahren zur Erzeugung von Signalwellen in einem zellularen CDMA Kommunikationssystem

System and method for generating signal waveforms in a CDMA cellular telephone system
Système et méthode de génération d'ondes de signaux dans un système de communication cellulaire
CDMA

Assignee: QUALCOMM INCORPORATED, 5775 Morehouse Drive, San Diego, CA 92121-1714, US (QUAL-N)

Inventor: Gilhousen, Klein S., San Diego, CA 92122, US

Weaver, Lindsay A., Jr., San Diego, CA 92122, US

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Agent: Wagner, Karl H., Dipl.-Ing., Wagner & Geyer, Patentanwalte, Gewurzmuhlstrasse 5, 80538 Munchen, DE

Language: EN

Application: EP 1991915727 A 19910621 (Division of application)

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Priority: US 1990543496 A 19900625

Related Publication: EP 1104955 A (Division of patent)

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Designated States: (Regional Original) AT BE CH DE DK ES FR GB GR IT LI LU NL SE

Original IPC: H04L-27/30(A) H04B-7/26(B) H04J-13/00(B)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,N,M,EP,20060101,20051008,A) H04J-11/00(R,N,M,EP,20060101,20051008,C) H04L-

1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-

1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C)

Original Abstract: A cell site, comprising:

- means for modulating configured to format digital data for transmission on a communications channel and to insert at least one timing command into the digital data, the digital data comprising a plurality of bits;
- means for transmitting coupled to the means for modulating and configured to receive the digital data from the means for modulating, convert the digital data to analog data, and transmit the analog data on the communications channel; and
- means for receiving configured to receive a signal from at least one remote unit and to determine a timing error of the received signal to be used to generate the timing command in accordance with the timing error,

the means for receiving being coupled to the means for modulating and configured to provide the timing command to the means for modulating.

Claim:

1. A cell site, comprising:

- means for modulating configured to format digital data for transmission on a communications channel and to insert at least one timing command into the digital data, the digital data comprising a plurality of bits;
- means for transmitting coupled to the means for modulating and configured to receive the digital data from the means for modulating, convert the digital data to analog data, and transmit the analog data on the communications channel; and
- means for receiving configured to receive a signal from at least one remote unit and to determine a timing error of the received signal to be used to generate the timing command in accordance with the timing error, the means for receiving being coupled to the means for modulating and configured to provide the timing command to the means for modulating.

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Publication Date: 20070815

Anordnung und Verfahren zur Erzeugung von Signalwellen in einem zellularen CDMA Kommunikationssystem

System and method for generating signal waveforms in a CDMA cellular telephone system
Système et méthode de génération d'ondes de signaux dans un système de communication cellulaire CDMA

Assignee: QUALCOMM INCORPORATED, 5775 Morehouse Drive, San Diego, CA 92121-1714, US (QUAL-N)

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Language: EN

Application: EP 1991915727 A 19920112 (Division of application)

EP 2001103642 A 20010222 (Division of application)

EP 200412940 A 19910621 (Local application)

EP 200527505 A 20051215 (Related to application)

EP 200527506 A 20051215 (Related to application)

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Current IPC: H04B-7/26(B,I,H,EP,20060101,20040615,A,L) H04J-13/00(B,I,H,EP,20060101,20040615,A,L)
H04L-27/30(B,I,H,EP,20060101,20040615,A,F) H04B-1/707(R,I,M,EP,20060101,20051008,A) H04B-
1/707(R,I,M,EP,20060101,20051008,C) H04B-7/26(B,I,H,EP,20060101,20040615,C,L) H04J-
11/00(R,N,M,EP,20060101,20051008,A) H04J-11/00(R,N,M,EP,20060101,20051008,C) H04J-
13/00(B,I,H,EP,20060101,20040615,C,L) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-
1/00(R,I,M,EP,20060101,20051008,C) H04L-27/26(B,I,H,EP,20060101,20040615,C,F)

Claim:

1. Ein Code-Multiplex-Vielfach-Zugriffszellenstandort (12, 14) (code division multiple access cell site bzw. CDMA-Zellenstandort) für ein CDMA System, das ein Soft-Handoff-Schema bzw. Schema zur weichen Übergabe besitzt, das einen Wechsel bzw. ein Umschalten zwischen Zellenstandorten (12, 14) erlaubt, und zwar soweit es eine Signalstärke diktiert bzw. vorschreibt, während eine Verbindung zu wenigstens einem Zellenstandort (12) beibehalten wird, wobei der Zellenstandort (12) konfiguriert ist zum Senden eines Pilottragersignals zum Erlangen einer Anfangssynchronisation und zum Aufrechterhalten einer robusten Zeitnachführung und wobei für jeden Sektor einer Zelle in dem CDMA System der gleiche Spreiz-Code, aber mit einem Zeitversatz für das Pilottragersignal genutzt wird und wobei der Zellenstandort Folgendes aufweist:
 - - Mittel zum Modulieren (66), die konfiguriert sind zum Formatisieren digitaler Daten zur Übertragung bzw. Sendung auf einem Kommunikationskanal und zum Einfügen von wenigstens einem Zeitsteuerungs- bzw. Timing-Befehl in die digitalen Daten, wobei die digitalen Daten eine Vielzahl von Bits aufweisen;
 - - Mittel zum Senden (58), die mit den Mitteln zum Modulieren (66), gekoppelt sind und die konfiguriert sind zum Empfangen der digitalen Daten von den Mitteln zum Modulieren, und zwar zum Konvertieren der digitalen Daten in analoge Daten und zum Senden der analogen Daten auf dem Kommunikationskanal; und
 - - Mittel zum Empfangen (32, 36), die konfiguriert sind zum Empfangen eines Signals von wenigstens einer entfernten Einheit (16, 18) und zum Bestimmen eines Zeit-Steuerungs- bzw. Timing-Fehlers von dem empfangenen Signal, der verwendet wird zum Erzeugen des Timing-Befehls gemäss dem Timing-Fehler, wobei die Mittel zum Empfangen (32, 36) mit den Mitteln zum Modulieren (66) gekoppelt sind und konfiguriert sind zum Vorsehen des Timing-Befehls an die Mittel zum Modulieren (66).
1. A code division multiple access cell site (12, 14) (CDMA cell site), for a CDMA system having a soft hand-off scheme that allows for switching between cell sites (12, 14) as signal strength dictates while maintaining a connection to at least one cell site (12), wherein the cell site (12) is configured to transmit a pilot carrier signal to obtain initial synchronisation and to maintain robust time tracking, and wherein for each sector of a cell in the CDMA system the same spreading code but with an offset in time is used for the pilot carrier signal, and wherein the cell site comprises:
 - * means for modulating (66) configured to format digital data for transmission on a communications channel and to insert at least one timing command into the digital data, the digital data comprising a plurality of bits;
 - * means for transmitting (58) coupled to the means for modulating 66 and configured to receive the digital data from the means for modulating, convert the digital data to analog data, and transmit the analog data on the communications channel; and
 - * means for receiving (32, 36) configured to receive a signal from at least one remote unit (16, 18) and to determine a timing error of the received signal to be used to generate the timing command in

accordance with the timing error, the means for receiving (32, 36) being coupled to the means for modulating (66) and configured to provide the timing command to the means for modulating (66).

1. Site de cellule (12, 14) a acces multiple par difference de code (site de cellule CDMA) pour un systeme CDMA ayant un processus de transfert progressif qui permet de commuter entre sites de cellule (12, 14) quand l'intensite du signal l'impose en maintenant une communication avec au moins un site de cellule (12), dans lequel le site de cellule (12) est agence pour emettre un signal de porteuse pilote pour obtenir une synchronisation initiale et pour maintenir un suivi temporel fiable, et dans lequel, pour chaque secteur d'une cellule dans le systeme CDMA, on utilise pour le signal de porteuse pilote le meme code d'etallement mais avec un decalage temporel, et dans lequel le site de cellule comprend:
 - un moyen de modulation (66) agence pour formater des donnees numeriques pour emission sur un canal de communication et pour inserer au moins une commande de synchronisation dans les donnees numeriques, les donnees numeriques comprenant une pluralite de bits;
 - un moyen d'emission (58) couple au moyen de modulation (66) et agence pour recevoir les donnees numeriques du moyen de modulation, convertir les donnees numeriques en donnees analogiques, et emettre les donnees analogiques sur le canal de communication; et
 - un moyen de reception (32, 36) agence pour recevoir un signal dudit au moins un poste distant (16, 18) et pour determiner une erreur de synchronisation du signal recu a utiliser pour produire la commande de synchronisation en fonction de l'erreur de synchronisation, le moyen de reception (32, 36) etant couple au moyen de modulation (66) et agence pour fournir une commande de synchronisation au moyen de modulation (66).

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System und Verfahren zur Erzeugung von Signalwellen in einem zellularen CDMA

Kommunikationssystem

System and method for generating signal waveforms in a CDMA cellular telephone system

Système et methode de generation d'ondes de signaux dans un systeme de communication cellulaire CDMA

Assignee: Qualcomm, Incorporated, 5775 Morehouse Drive, San Diego, CA 92121-1714, US (QUAL-N)

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3/00(B,I,H,EP,20060101,20060124,A,L)

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1/707(B,I,H,EP,20060101,20060124,C,L) H04B-7/26(B,I,H,EP,20060101,20060124,A,L) H04B-

7/26(B,I,H,EP,20060101,20060124,C,L) H04J-11/00(B,I,H,EP,20060101,20060124,A,L) H04J-11/00(B,I,H,EP,20060101,20060124,C,L) H04J-3/00(B,I,H,EP,20060101,20060124,A,L) H04J-3/00(B,I,H,EP,20060101,20060124,C,L)

Original Abstract: A cell site, comprising:

- means for modulating configured to format digital data for transmission on a communications channel and to insert at least one timing command into the digital data, the digital data comprising a plurality of bits;
- means for transmitting coupled to the means for modulating and configured to receive the digital data from the means for modulating, convert the digital data to analog data, and transmit the analog data on the communications channel; and
- means for receiving configured to receive a signal from at least one remote unit and to determine a timing error of the received signal to be used to generate the timing command in accordance with the timing error, the means for receiving being coupled to the means for modulating and configured to provide the timing command to the means for modulating.

Claim:

1. A modulation system for use in spread spectrum communications, comprising:

- means for generating a first orthogonal sequence signal corresponding to a selected one of a plurality of orthogonal binary sequences;
- means for generating a pseudo-noise (PN) signal corresponding to a predetermined PN binary sequence;
- means for combining said first orthogonal sequence signal and said PN signal and for providing a resultant first modulation signal.

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Publication Date: 20060315

System und Verfahren zur Erzeugung von Signalwellen in einem zellularen CDMA-Kommunikationssystem

System and method for generating signal waveforms in a CDMA cellular telephone system
Systeme et methode de generation d'ondes de signaux dans un systeme de communication cellulaire CDMA

Assignee: Qualcomm, Incorporated, 5775 Morehouse Drive, San Diego, CA 92121-1714, US (QUAL-N)

Inventor: Gilhousen, Klein S., c/o Qualcomm Incorporated, 5775 Morehouse Drive, San Diego, CA 92121-1714, US

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Jacobs, Irwin M., c/o Qualcomm Incorporated, 5775 Morehouse Drive, San Diego, CA 92121-1714, US

Agent: Wagner, Karl H., WAGNER & GEYER, Patentanwalte, Gewurzmuhlstrasse 5, 80538 Munchen, DE

Language: EN

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Designated States: (Regional Original) AT BE CH DE DK ES FR GB GR IT LI LU NL SE

Original IPC: H04B-1/707(B,I,H,EP,20060101,20060124,A,F) H04B-7/26(B,I,H,EP,20060101,20060124,A,L) H04J-11/00(B,I,H,EP,20060101,20060124,A,L) H04J-3/00(B,I,H,EP,20060101,20060124,A,L)

Current IPC: H04B-1/707(B,I,H,EP,20060101,20060124,A,F) H04B-1/707(B,I,H,EP,20060101,20060124,C,L) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(B,I,H,EP,20060101,20060124,C,L) H04J-11/00(B,I,H,EP,20060101,20060124,A,L) H04J-11/00(B,I,H,EP,20060101,20060124,C,L) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-3/00(B,I,H,EP,20060101,20060124,A,L) H04J-3/00(B,I,H,EP,20060101,20060124,C,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,A) H04L-27/26(R,I,M,RO,20060101,20060104,C,L) H04L-27/30(R,I,M,RO,20060101,20060104,A,L) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Original Abstract: A cell site, comprising:

- means for modulating configured to format digital data for transmission on a communications channel and to insert at least one timing command into the digital data, the digital data comprising a plurality of bits;
- means for transmitting coupled to the means for modulating and configured to receive the digital data from the means for modulating, convert the digital data to analog data, and transmit the analog data on the communications channel; and
- means for receiving configured to receive a signal from at least one remote unit and to determine a timing error of the received signal to be used to generate the timing command in accordance with the timing error, the means for receiving being coupled to the means for modulating and configured to provide the timing command to the means for modulating.

Claim:

1. In a direct sequence spread spectrum modulator, a signal orthogonalizer comprising:
 - pilot channel signal generator means for generating a pilot signal according to a first orthogonal function; and
 - communication channel signal generator means for receiving an input information signal, generating an orthogonal function signal according to a second orthogonal function, combining said orthogonal function signal with said input information signal to provide a resultant communication channel signal.

Publication No. EP 1835633 A2 (Update 200763 E)

Publication Date: 20070919

System und Verfahren zur Erzeugung von Signalwellenformen in einem CDMA-Mobiltelefonsystem

System and method for generating signal waveforms in a CDMA cellular telephone system

Systeme et procede de generation de formes d'ondes de signaux dans un systeme de telephone cellulaire

CDMA

Assignee: Qualcomm, Incorporated, 5775 Morehouse Drive, San Diego, CA 92121-1714, US (QUAL-N)

Inventor: Gilhousen, Klein S., c/o QUALCOMM INCORPORATED, 5775 Morehouse Drive, San Diego, CA 92121-1714, US

WEAVER L A

JACOBS I

Agent: Carstens, Dirk Wilhelm, Wagner & Geyer, Gewurzmuhlstrasse 5, D-80538 Munchen, DE

Language: EN

Application: EP 1991915727 A 19920112 (Division of application)

EP 2001103642 A 20010222 (Division of application)

EP 200412940 A 20040601 (Division of application)

EP 200712816 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Related Publication: EP 1104955 A (Division of patent)

EP 1450531 A (Division of patent)

EP 536334 A (Division of patent)

Designated States: (Regional Original) AT BE CH DE DK ES FR GB GR IT LI LU NL SE

Original IPC: H04B-1/707(B,I,H,EP,20060101,20070809,A,F) H04B-1/707(B,I,M,98,20060101,20070809,C)

Current IPC: H04B-1/707(B,I,H,EP,20060101,20070809,A,F) H04B-1/707(B,I,M,98,20060101,20070809,C)

Original Abstract: A cell site, comprising:

means for modulating configured to format digital data for transmission on a communications channel and to insert at least one timing command into the digital data, the digital data comprising a plurality of bits;

means for transmitting coupled to the means for modulating and configured to receive the digital data from the means for modulating, convert the digital data to analog data, and transmit the analog data on the communications channel; and

means for receiving configured to receive a signal from at least one remote unit and to determine a timing error of the received signal to be used to generate the timing command in accordance with the timing error, the means for receiving being coupled to the means for modulating and configured to provide the timing command to the means for modulating.

Claim:

1. A cell site, comprising:

- means for modulating (66) configured to format digital data for transmission on a communications channel and to insert at least one timing command into the digital data, the digital data comprising a plurality of bits;
- means for transmitting (58) coupled to the means for modulating (66) and configured to receive the digital data from the means for modulating, convert the digital data to analog data, and transmit the analog data on the communications channel; and
- means for receiving (32, 36) configured to receive a signal from at least one remote unit (16, 18) and to determine a timing error of the received signal to be used to generate the timing command in accordance with the timing error, the means for receiving (32, 36) being coupled to the means for modulating (66) and configured to provide the timing command to the means for modulating (66).

Publication No. EP 536334 A1 (Update 199315 E)

Publication Date: 19930414

SYSTEM UND VERFAHREN ZUR ERZEUGUNG VON SIGNALWELLENFORMEN IN EINEM CDMA ZELLULAR-FERNSPRECHSYSTEM

SYSTEM AND METHOD FOR GENERATING SIGNAL WAVEFORMS IN A CDMA CELLULAR TELEPHONE SYSTEM

SYSTEME ET PROCEDE GENERATEUR DE FORMES D'ONDES DE SIGNAUX DANS UN SYSTEME TELEPHONIQUE CELLULAIRE AMDC

Assignee: QUALCOMM, INC., 10555 Sorrento Valley Road, San Diego California 92121, US (QUAL-N)

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PADOVANI, Roberto, 12634 Futura St., San Diego, CA 92130, US

WEAVER, Lindsay, A., Jr., 3419 Tony Dr., San Diego, CA 92122, US

WHEATLEY, Charles, E., III, 2208 Caminito Del Barco, Del Mar, CA 92014, US

VITERBI, Andrew, J., 2712 Glenwick Place, La Jolla, CA 92037, US

Agent: Wagner, Karl H. et al, WAGNER & GEYER Patentanwaelte Gewuerzmuehlstrasse 5 Postfach 22 14 39, W-8000 Muenchen 22, DE

Language: EN (77 pages, 15 drawings)

Application: EP 1991915727 A 19910621 (Local application)

WO 1991US4400 A 19910621 (PCT Application)

Priority: US 1990543496 A 19900625

Related Publication: WO 1992000639 A (Based on OPI patent)

Designated States: (Regional Original) AT BE CH DE DK ES FR GB GR IT LI LU NL SE

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,J,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site (12, 14) and mobile units (16, 18) using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signalling along with QPSK spreading.

Claim: An orthogonal sequence signal generated corresponding to an orthogonal binary sequence (Walsh sequence) is combined with a pseudo-noise (PN) signal corresponding to a predetermined augmented length maximal linear sequence PN code to provide a modulation signal. This is combined with an input information signal providing a spread spectrum information signal.

The signal is communicated between cell-site (12,14) and mobile units (16,18) with pilot, sync, paging and voice channels defined. Information is encoded, interleaved, BPSK modulated with orthogonal covering of each symbol along with QPSK spreading.

Publication No. EP 536334 A4 (Update 199528 E)

Publication Date: 19931201

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

JACOBS I M
PAODOVANI R
WEAVER L A
WHEATLEY C E
VITERBI A J

Language: EN

Application: EP 1991915727 A 19910621 (Local application)

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)
H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-
7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-
11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-
13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-
13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-
13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-
3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-
3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-
1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-
1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-
23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-
5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-
7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. EP 536334 B1 (Update 200241 E)

Publication Date: 20020522

**SYSTEM UND VERFAHREN ZUR ERZEUGUNG VON SIGNALWELLENFORMEN IN EINEM
CDMA ZELLULAR-FERNSPRECHSYSTEM**

**SYSTEM AND METHOD FOR GENERATING SIGNAL WAVEFORMS IN A CDMA CELLULAR
TELEPHONE SYSTEM**

**SYSTEME ET PROCEDE GENERATEUR DE FORMES D'ONDES DE SIGNAUX DANS UN
SYSTEME TELEPHONIQUE CELLULAIRE AMDC**

Assignee: QUALCOMM, INC., 10555 Sorrento Valley Road, San Diego, California 92121, US (QUAL-N)

Inventory: GILHOUSEN, Klein, S., 4039 Calgary Avenue, San Diego, CA 92122, US

JACOBS, Irwin, M., 2710 Inverness Ct., La Jolla, CA 92037, US

PAODOVANI, Roberto, 12634 Futura St., San Diego, CA 92130, US

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WHEATLEY, Charles, E., III, 2208 Caminito Del Barco, Del Mar, CA 92014, US

VITERBI, Andrew, J., 2712 Glenwick Place, La Jolla, CA 92037, US

Agent: Wagner, Karl H., Dipl.-Ing., WAGNER & GEYER, Patentanwalte, Gewurzmuhlstrasse 5, 80538

Munchen, DE

Language: EN

Application: EP 1991915727 A 19910621 (Local application)

WO 1991US4400 A 19910621 (PCT Application)

EP 2001103642 A 19910621 (Related to application)

Priority: US 1990543496 A 19900625

Related Publication: EP 1104955 A (Related to patent)

WO 1992000639 A (Based on OPI patent)

Designated States: (Regional Original) AT BE CH DE DK ES FR GB GR IT LI LU NL SE

Original IPC: H04L-27/30(A) H04B-7/26(B) H04J-13/00(B) H04L-5/02(B) H04L-5/12(B) H04L-23/02(B)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Claim:

1. Modulationssystem fur den Einsatz in Bandspreizkommunikationen, das Folgendes aufweist:

- Mittel (254i, 254j) zum Erzeugen eines ersten orthogonalen Sequenzsignals, das einem Eingabeinformationssignal fur dessen Dauer zugewiesen ist und eine aus einer Vielzahl von orthogonalen binaren Sequenzen ausgewahlten Sequenz entspricht;
- Mittel (196, 198) zum Erzeugen eines Pseudo-Rauschsignals (pseudo-noise = PN), dass einer vorbestimmten PN-Binarsequenz entspricht; und
- Mittel (252i, 252j, 256i, 256j, 258i, 258j, 284, 286, 292) zum Kombinieren des ersten orthogonalen Sequenzsignals mit dem Eingabeinformationssignal und dem PN-Signal um ein kombiniertes Signal zu erzeugen, dass das Eingabeinformationssignal in einem Kanal definiert.

1. A modulation system for use in spread spectrum communications, comprising:

- means (254i, 254j) for generating a first orthogonal sequence signal assigned to an input information signal for the duration thereof and corresponding to a selected one of a plurality of orthogonal binary sequences;
- means (196, 198) for generating a pseudo-noise PN signal corresponding to a predetermined PN binary sequence; and
- means (252i, 252j, 256i, 256j, 258i, 258j, 284, 286, 292) for combining said first orthogonal sequence signal with said input information signal and said PN signal to produce a combined signal defining said input information signal in a channel.

1. Systeme de modulation destine a etre utilise dans des communications a eteallement de spectre comprenant:

- des moyens (254i, 254j) pour produire un premier signal de sequence orthogonale attribue a un signal d'information d'entree pendant la duree de ce signal et correspondant a une sequence selectionnee parmi une pluralite de sequences binaires orthogonales;
- des moyens (196, 198) pour produire un signal de pseudo-bruit PN correspondant a une sequence binaire PN predeterminee; et
- des moyens (252i, 252j, 256i, 256j, 258i, 258j, 284, 286, 292) pour combiner le premier signal de sequence orthogonale avec le signal d'information d'entree et le signal PN pour produire un signal combine definissant le signal d'information d'entree dans un canal.

Spain

Publication No. ES 2174823 T3 (Update 200302 E)

Publication Date: 20021116

Assignee: QUALCOMM INC (QUAL-N)

Language: ES

Application: EP 1991915727 A 19910621 (Application)

Priority: US 1990543496 A 19900625

Related Publication: EP 536334 A (Based on OPI patent)

Original IPC: H04L-27/30(A) H04B-7/26(B) H04J-13/00(B) H04L-5/02(B) H04L-5/12(B) H04L-23/02(B)
Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)
H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-
7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-
11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-
13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-
13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-
13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-
3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-
3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-
1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-
1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-
23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-
5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-
7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. ES 2220603 T3 (Update 200506 E)

Publication Date: 20041216

Assignee: QUALCOMM INC (QUAL-N)

Language: ES

Application: EP 2001103642 A 19910621 (Application)

Priority: US 1990543496 A 19900625

Related Publication: EP 1104955 A (Based on OPI patent)

Original IPC: H04B-1/707(A) H04B-7/26(B)
Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)
H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-
7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-
11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-
13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-
13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-
13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-
3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-
3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-
1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-
1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-
23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-
5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-
7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Finland

Publication No. FI 1113125 B1 (Update 200416 E)

Publication Date: 20040227

Language: FI

Application: WO 1991US4400 A 19910621 (PCT Application)

FI 19925812 A 19921221 (Local application)

Priority: US 1990543496 A 19900625

Related Publication: FI 9205812 A (Previously issued patent)

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

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Publication Date: 20030602

Language: FI

Application: WO 1991US4400 A 19910621 (PCT Application)

FI 19925812 A 19921221 (Division of application)

FI 2003823 A 20030602 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04L(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. FI 200301396 A (Update 200377 E)

Publication Date: 20030926

Language: FI

Application: WO 1991US4400 A 19910621 (PCT Application)

FI 2003823 A 20030602 (Division of application)

FI 20031396 A 20030926 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-

3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-

3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-

23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-

5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-

7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. FI 199205812 A (Update 199312 E)

Publication Date: 19921221

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

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PADOVANI R

WEAVER L A

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VITERBI A J

Language: FI

Application: WO 1991US4400 A 19910621 (PCT Application)

FI 19925812 A 19921221 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04L(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-

3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-

3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-

23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-

5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-

7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Hungary

Publication No. HU 216989 B (Update 199953 E)

Publication Date: 19991028

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

JACOBS I M

PADOVANI R

VITERBI A J

WEAVER L A

WHEATLEY C E

Language: HU

Application: WO 1991US4400 A 19910621 (PCT Application)

HU 19924111 A 19910621 (Local application)

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Related Publication: HU 64657 A (Previously issued patent)

WO 1992000639 A (Based on OPI patent)

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-27/26(R,I,M,RO,20060101,20060104,C,L) H04L-27/30(R,I,M,RO,20060101,20060104,A,L) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

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Publication Date: 19940128

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

JACOBS I M

PADOVANI R

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VITERBI A J

Language: HU

Application: WO 1991US4400 A 19910621 (PCT Application)

HU 19924111 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Related Publication: WO 1992000639 A (Based on OPI patent)

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Israel

Publication No. IL 98598 A (Update 199419 E)

Publication Date: 19940227

Assignee: QUALCOMM INC (QUAL-N)

Language: EN

Application: IL 98598 A 19910624 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04L-27/30(A) H04J-11/00(B)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Japan

Publication No. JP 6501349 W (Update 199411 E)

Publication Date: 19940210

Assignee: QUALCOMM INC (QUAL-N)

Language: JA

Application: JP 1991514045 A 19910621 (Local application)

WO 1991US4400 A 19910621 (PCT Application)

Priority: US 1990543496 A 19900625

Related Publication: WO 1992000639 A (Based on OPI patent)

Original IPC: H04J-13/00(A) H04B-7/26(B)

Publication No. JP 11317691 A (Update 200005 E)

Publication Date: 19991116

SYSTEM AND METHOD FOR GENERATING SIGNAL WAVEFORM OF CDMA CELLULAR PHONE

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN KLEIN S

JACOBS IRWIN M

PADOVANI ROBERTO

WEAVER JR LINDSAY A

WHEATLEY III CHARLES E

VITERBI ANDREW J

Language: JA (40 pages)

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Priority: US 1990543496 A 19900625

Original IPC: H04B-1/707(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-

3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-

3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-

23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-

5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-

7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. JP 3357620 B2 (Update 200302 E)

Publication Date: 20021216

Language: JA (37 pages)

Application: JP 1991514045 A 19910621 (Division of application)

JP 199960927 A 19910621 (Local application)

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Related Publication: JP 11317691 A (Previously issued patent)

Original IPC: H04J-13/04(A) H04B-1/707(B)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-

3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-

3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Korea

Publication No. KR 134390 B1 (Update 200004 E)

Publication Date: 19980427

Assignee: QUALCOMM INC; US (QUAL-N)

Language: KO

Application: WO 1991US4400 A 19910621 (PCT Application)

KR 1992703318 A 19921221 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Norway

Publication No. NO 200302576 A (Update 200356 E)

Publication Date: 19921223

Language: NO

Application: WO 1991US4400 A 19910621 (PCT Application)

NO 19925019 A 19921223 (Division of application)

NO 20032576 A 20030606 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04B-1/707(A)

Current IPC: H04B-1/707(A)

Publication No. NO 316557 B1 (Update 200412 E)

Publication Date: 20040202

Language: NO

Application: WO 1991US4400 A 19910621 (PCT Application)

NO 19925019 A 19921223 (Local application)

Priority: US 1990543496 A 19900625
Related Publication: NO 9205019 A (Previously issued patent)
Original IPC: H04B-1/707(A)
Current IPC: H04B-1/707(A)

Publication No. NO 317910 B1 (Update 200502 E)

Publication Date: 20041227

Assignee: QUALCOMM INC (QUAL-N)

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Language: NO

Application: WO 1991US4400 A 19910621 (PCT Application)

NO 19925019 A 19910621 (Division of application)

NO 20032576 A 20030606 (Local application)

Priority: US 1990543496 A 19900625

Related Publication: NO 200302576 A (Previously issued patent)

Original IPC: H04B-1/707(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051110,A) H04B-1/707(R,I,M,EP,20060101,20051110,C)

Publication No. NO 199205019 A (Update 199316 E)

Publication Date: 19921223

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

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Language: NO

Application: WO 1991US4400 A 19910621 (PCT Application)

NO 19925019 A 19921223 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04L-27/30(A)

Current IPC: H04L(R,A,I,M,EP,20060101,20051110,S) H04L-27/26(R,I,M,EP,20060101,20051110,C)

H04L-27/30(R,I,M,EP,20060101,20051110,A)

Portugal

Publication No. PT 98079 A (Update 199338 E)

Publication Date: 19930831

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

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WEAVER L A

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Language: PT

Application: PT 98079 A 19910624 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04B-7/00(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Romania

Publication No. RO 118688 B1 (Update 200374 E)

Publication Date: 20030829

Language: RO

Application: WO 1991US4400 A 19910621 (PCT Application)

RO 19921620 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Related Publication: WO 1992000639 A (Based on OPI patent)

Original IPC: H04L-27/30(A) H04B-7/26(B) H04J-13/00(B) H04L-5/02(B) H04L-5/12(B) H04L-23/02(B)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. RO 120519 B1 (Update 200638 E)

Publication Date: 20060228

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K
JACOBS I M
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WHEATLEY C E
VITERBI A J

Language: RO

Application: RO 2001980 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04L-27/26(I,98,20060101,C,F) H04L-27/30(I,RO,20060101,A,F)

Current IPC: H04B-1/707(R,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-

3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-

3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-

23/02(R,I,M,EP,20060101,20051008,A) H04L-27/26(B,I,H,RO,20060101,20060228,C,F) H04L-

27/30(B,I,H,RO,20060101,20060228,A,F) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-

5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-

7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Russia

Publication No. RU 2125344 C1 (Update 200020 E)

Publication Date: 19990120

Assignee: QUALCOMM INC (QUAL-N)

Language: RU

Application: RU 199216467 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-

3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-

3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-

23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-

5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-

7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Singapore

Publication No. SG 52735 A1 (Update 199904 E)

Publication Date: 19980928

Assignee: QUALCOMM INC (QUAL-N)

Inventor: VITERBI A J

WHEATLEY C E

JACOBS I M

GILHOUSEN K S

WEAVER L A

PADOVANI R

Language: EN

Application: SG 19968524 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Slovakia

Publication No. SK 281176 B6 (Update 200107 E)

Publication Date: 20001211

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

JACOBS I M

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WHEATLEY C E

VITERBI A J

Language: SK

Application: WO 1991US4400 A 19910621 (PCT Application)

CS 19923871 A 19910621 (Local application)

Priority: US 1990543496 A 19900625

Related Publication: SK 9203871 A (Previously issued patent)

Original IPC: H04L-27/30(A) H04B-7/216(B) H04L-5/02(B) H04L-5/12(B) H04L-23/02(B)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,A) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-23/02(R,I,M,EP,20060101,20051008,C) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04L-5/12(R,I,M,EP,20060101,20051008,C) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. SK 199203871 A3 (Update 199436 E)

Publication Date: 19940810

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

JACOBS I M

PADOVANI R

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VITERBI A J

Language: SK

Application: WO 1991US4400 A 19910621 (PCT Application)

CS 19923871 A 19921223 (Local application)

Priority: US 1990543496 A 19900625

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,A) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-23/02(R,I,M,EP,20060101,20051008,C) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04L-5/12(R,I,M,EP,20060101,20051008,C) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

United States

Publication No. US 20030053519 A1 (Update 200323 E)

Publication Date: 20030320

System and method for generating signal waveforms in a CDMA cellular telephone system

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Viterbi, Andrew J., La Jolla, CA, US (VITE-I)

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Viterbi, Andrew J., La Jolla, CA, US

Agent: Qualcomm Incorporated, Patents Department, 5775 Morchouse Drive, San Diego, CA, US

Language: EN

Application: US 1990543496 A 19900625 (Continuation of application)

US 1992825147 A 19920124 (Continuation of application)

US 1995441895 A 19950516 (Continuation of application)

US 1999360059 A 19990723 (Continuation of application)

US 2002263898 A 20021002 (Local application)

Related Publication: US 5103459 A (Continuation of patent)

US 5416797 A (Continuation of patent)

US 5943361 A (Continuation of patent)

Original IPC: H04B-1/707(A)

Current IPC: H04B-1/707(R,I,A,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

3/02(R,I,M,EP,20060101,20051008,A) H04J-3/02(R,I,M,EP,20060101,20051008,C) H04J-

3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-

3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-

1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-

1/02(R,I,M,EP,20060101,20051008,C) H04L-1/06(R,I,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-

23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-

5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-

5/12(R,I,M,EP,20060101,20051008,A)

Original US Class (secondary): 375141

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded,

interleaved, orthogonal signaling along with QPSK spreading.

Claim: We claim:

1. A spread spectrum communication system comprising:

- a plurality of base stations each operable for communication with at least one user unit;
- two receiving systems each for receiving independently a user unit signal transmitted from a user unit as a direct sequence spread spectrum signal within which an information signal is modulated; and
- a diversity combiner coupled to the two receiving system for combining signals received thereby to reconstruct the user unit signal.

Publication No. US 20040156427 A1 (Update 200454 E)

Publication Date: 20040812

System and method for generating signal waveforms in a CDMA cellular telephone system

Assignee: Gilhousen, Klein S., Bozeman, MT, US (GILH-I)

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Jacobs, Irwin M., La Jolla, CA, US

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Weaver, Lindsay A. JR., Boulder, CO, US

Wheatley, Charles E. III, Del Mar, CA, US

Viterbi, Andrew J., La Jolla, CA, US

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Language: EN

Application: US 1990543496 A 19900625 (Continuation of application)

US 1992825147 A 19920124 (Continuation of application)

US 1995441895 A 19950516 (Continuation of application)

US 1999360059 A 19990723 (Division of application)

US 2004772490 A 20040205 (Local application)

Related Publication: US 5103459 A (Continuation of patent)

US 5416797 A (Continuation of patent)

US 5943361 A (Continuation of patent)

US 6693951 A (Division of patent)

Original IPC: H04B-1/707(A)

Current IPC: H04B-1/707(R,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

3/02(R,I,M,EP,20060101,20051008,A) H04J-3/02(R,I,M,EP,20060101,20051008,C) H04J-

3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-

3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-

1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-

1/02(R,I,M,EP,20060101,20051008,C) H04L-1/06(R,I,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04L-5/12(R,I,M,EP,20060101,20051008,C)

Original US Class (secondary): 375150

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signaling along with QPSK spreading.

Claim: We claim:

1. 1. A spread-spectrum signal receiver comprising:

- a PN sequence generator for generating a PN sequence;
- a correlator coupled to the PN sequence generator and configured to produce a despread signal by correlating the generated PN sequence and a received spread-spectrum signal; and
- processing circuitry coupled to the correlator for processing the despread signal to extract time information therefrom.

Publication No. US 20060088134 A1 (Update 200629 E)

Publication Date: 20060427

System and method for generating signal waveforms in a CDMA cellular telephone system

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Padovani, Roberto, San Diego, CA, US Residence: US Nationality: US (PADO-I)

Weaver, Lindsay A. JR., Boulder, CO, US Residence: US Nationality: US (WEAV-I)

Wheatley, Charles E. III, Del Mar, CA, US Residence: US Nationality: US (WHEA-I)

Viterbi, Andrew J., La Jolla, CA, US Residence: US Nationality: US (VITE-I)

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WEAVER L A

WHEATLEY C E

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Agent: QUALCOMM, INC, 5775 MOREHOUSE DR., SAN DIEGO, CA, US

Language: EN

Application: US 1990543496 A 19900625 (Continuation of application)

US 1992825147 A 19920124 (Continuation of application)

US 1995441895 A 19950516 (Continuation of application)

US 1999360059 A 19990723 (Continuation of application)

US 2004772490 A 20040205 (Continuation of application)

US 2005297264 A 20051207 (Local application)

Related Publication: US 5103459 A (Continuation of patent)

US 5416797 A (Continuation of patent)

US 5943361 A (Continuation of patent)

US 6693951 A (Continuation of patent)

US 7003021 A (Continuation of patent)

Original IPC: H04B-1/707(B,I,H,US,20060101,20060427,A,F) H04L-

27/02(B,I,H,98,20060101,20060427,C,L) H04L-27/08(B,I,H,US,20060101,20060427,A,L)

Current IPC: H04B-1/707(B,I,H,US,20060101,20060427,A,F) H04B-

1/707(B,I,H,US,20060101,20060427,C,L) H04L-27/02(B,I,H,US,20060101,20060427,C,L) H04L-

27/08(B,I,H,US,20060101,20060427,A,L)

Original US Class (secondary): 375345 375150

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the exemplary embodiment, transmit power of mobile unit signals is controlled based on signal power received by the mobile unit and power adjustment commands sent to the mobile unit.

Claim:

1. 1. A mobile unit, comprising:

- means for receiving a signal including power adjustment commands;
- first means for adjusting a power level of a transmit signal in response to the power adjustment commands; and
- second means for adjusting the power level of the transmit signal in response to a power level of the signal.

Publication No. US 5103459 A (Update 199217 E)

Publication Date: 19920407

System and method for generating signal waveforms in a CDMA cellular telephone system

Assignee: Qualcomm Incorporated (QUAL-N)

Inventor: Gilhousen, Klein S., CA, US

Jacobs, Irwin M.

Padovani, Roberto

Weaver, Jr., Lindsay A.

Wheatley, III, Charles E.

Viterbi, Andrew J.

Agent: Miller, Russell B.

Language: EN (38 pages)

Application: US 1990543496 A 19900625 (Local application)

Original IPC: H04L-27/30(B)

Current IPC: H04B-1/707(R,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

13/04(R,I,M,EP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-

3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Original US Class (secondary): 3751 37018 37021 37022 37568 37959 38034 45533.1 45554.1

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signalling along with QPSK spreading.

Publication No. US 5103459 B1 (Update 199933 E)

Publication Date: 19990706

Assignee: QUALCOMM INC (QUAL-N)

Inventor: GILHOUSEN K S

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PADOVANI R

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Language: EN

Application: US 1990543496 A 19900625 (Local application)

Original IPC: H04B-1/707(A) H04J-13/04(B) H04Q-7/30(B)

Current IPC: H04B-1/707(R,A,J,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Publication No. US 5309474 A (Update 199417 E)

QIS

Researcher: Carol Hyne

1/1/2016

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Publication Date: 19940503

System and method for generating signal waveforms in a CDMA cellular telephone system

Assignee: Qualcomm Incorporated (QUAL-N)

Inventor: Viterbi, Andrew J.

Wheatley, III, Charles E.

Gilhousen, Klein S., CA, US

Padovani, Roberto

Jacobs, Irwin M.

Weaver, Jr., Lindsay A.

Agent: Miller, Russell B.

Language: EN (37 pages, 13 drawings)

Application: US 1990543496 A 19900625 (Continuation of application)

US 1992858781 A 19920327 (Local application)

Related Publication: US 5103459 A (Continuation of patent)

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-

7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

13/04(R,I,M,JP,20060101,20051220,A,L) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-

3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-

3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-

23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-

5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-

7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Original US Class (secondary): 3751 37568 38034 37018 37021 37022 37959 45533.1 45554.1

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signalling along with QPSK spreading.

Claim:

1. A communication system in which a plurality of remote user stations communicate with other user stations, via a radio link with a base station, said communication system comprising: a base station having base station transmission means for communicating user station information signals to intended recipient remote user stations, said base station transmission means comprising: (a) pilot channel signal generator means for generating as a pilot signal an orthogonal function signal according to a first Walsh function selected from a set of Walsh functions; (b) at least one communication channel signal generator means

each for receiving a respective user station information signal each intended for a different one of said remote user stations, generating an additional Walsh function signal according to an additional Walsh function selected from said set of Walsh functions wherein each additional Walsh function is different from said first Walsh function, combining each additional Walsh function signal with said respective user station information signal to produce a respective communication channel signal; (c) base station spreading means for receiving said pilot signal and each communication channel signal, generating a base station pseudorandom noise (PN) signal of a first predetermined PN code, combining said PN signal with each of said pilot channel and communication channel signals to produce corresponding base station PN spread pilot and communication signals; and (d) base station transmission means for receiving and modulating said base station PN spread pilot and communication channel signals upon a base station carrier signal and transmitting said modulated base station carrier signal as a base station communication signal; said base station having base station reception means for receiving and extracting from each remote user station transmitted remote user station communication signal a corresponding remote user station information signal destined for intended recipient user stations; at least one remote user station each having remote user station transmission means for communicating remote user station information signals to said base station, said remote user station transmission means comprising: (a) orthogonal function encoder means for, receiving an input remote user station information signal, converting sequential portions of said input signal into respective Walsh function signal portions wherein each Walsh function signal portion is according to a Walsh function selected from a plurality of Walsh functions according to a value of said respective portions of said input remote user station information signal, and providing an output of said Walsh functions functions function signal portions; (b) remote user station spreading means for, receiving each of said Walsh function signal portions, generating a remote user station pseudorandom noise (PN) signal of a second predetermined PN code, combining said Walsh function signal portions with said remote user station PN signal so as to produce a remote user station PN spread signal; and (c) remote user station transmission means for receiving and modulating said remote user station PN spread signal upon a remote user station carrier signal and transmitting said modulated remote user station carrier signal as a remote user station communication signal; and said at least one remote user station each having remote user station reception means for receiving and extracting from said base station communication signal said user station information signal intended for each respective remote user station.

Publication No. US 5416797 A (Update 199525 E)

Publication Date: 19950516

System and method for generating signal waveforms in a CDMA cellular telephone system

Assignee: Qualcomm Incorporated (QUAL-N)

Inventor: Viterbi, Andrew J.

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Padovani, Roberto

Jacobs, Irwin M.

Weaver, Jr., Lindsay A.

Agent: Miller, Russell B.

Language: EN (35 pages, 13 drawings)

Application: US 1990543496 A 19900625 (Continuation of application)

US 1992825147 A 19920124 (Local application)

Related Publication: US 5103459 A (Continuation of patent)

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-13/04(R,I,M,EP,20060101,20051008,A) H04J-13/04(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-5/12(R,I,M,EP,20060101,20051008,A) H04Q-7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Original US Class (secondary): 375705 38034 37018 37021 37022 37959 45533.1 45554.1

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, hi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signalling along with QPSK spreading.

Claim:

1. A spread spectrum modulator for modulating variable rate input digital data for transmission, said input digital data being provided in data frames of a predetermined time duration with each frame of input digital data having a number of data bits corresponding to one of several predetermined frame bit counts, said modulator comprising: a convolutional encoder having an input receiving said frames of input digital data and an output; a data interleaver having an input coupled to said convolutional encoder output and an output; a Walsh function encoder having an input coupled to said interleaver output and an output; a first pseudorandom noise (PN) code generator having an output; a first exclusive-OR gate having a pair of inputs and an output, one of said first exclusive-OR gate inputs coupled to said first PN code generator output and another of said first exclusive-OR gate inputs coupled to said Walsh encoder output; a second PN code generator having an output; a third PN code generator having an output; a second exclusive-OR gate having a pair of inputs and an output, one of said second exclusive-OR gate inputs coupled to said second PN code generator output and another of said second exclusive-OR gate inputs coupled to said first exclusive-OR gate output; and a third exclusive-OR gate having a pair of inputs and an output, one of said third exclusive-OR gate inputs coupled to said third PN code generator output and another of said third exclusive-OR gate inputs coupled to said first exclusive-OR gate output.

Publication No. US 5715236 A (Update 199812 E)

Publication Date: 19980203

System and method for generating signal waveforms in a CDMA cellular telephone system.

Assignee: Qualcomm Incorporated, San Diego, CA, US (QUAL-N)

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Weaver, Jr., Lindsay A., San Diego, CA, US
Agent: Laughlin, Jr.; James H.
Miller; Russell B.

Language: EN (34 pages, 13 drawings)

Application: US 1990543496 A 19900625 (Continuation of application)

US 1992858781 A 19920327 (Continuation of application)

US 1993156757 A 19931124 (Local application)

Related Publication: US 5103459 A (Continuation of patent)

US 5309474 A (Continuation of patent)

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)
H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-
7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-
11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-
13/00(R,N,M,EP,20060101,20051008,A) H04J-13/00(R,N,M,EP,20060101,20051008,C) H04J-
13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-
3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-
3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-
1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-
1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-
5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C)

Original US Class (secondary): 370209 375206 375309 37959 38034 45533.1 45554.1

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signalling along with QPSK spreading.

Claim:

1. Claim 2. A high-capacity-spread-spectrum transmitter, handling at least spread-spectrum signals for use with a communications channel, comprising:

- a plurality of data signals;
- generic means for generating a generic-chip-code signal;
- a plurality of message means for generating a plurality of message-chip-code signal wherein each message-chip-code signal is orthogonal to the other message-chip-code signals of plurality of message-chip-code signals, and is synchronized to the generic-chip-code signal;
- a plurality of spreading means coupled to said demultiplexer means and said plurality of message means, respectively, for spread-spectrum processing the plurality of demultiplexed-data signals with the plurality of message-chip-code signals to generate a plurality of spread-spectrum processed signals, respectively;

- summer means for combining the generic-chip-code signal with the plurality of spread-spectrum processed signals;
- transmitter means for transmitting the combined generic-chip-code signal and plurality of spread-spectrum-processed signals, on a carrier signal over said communications channel as a spread-spectrum communications signal.

Publication No. US 5841806 A (Update 199903 E)

Publication Date: 19981124

Method and apparatus for the transmission of energy-scaled variable rate data.

Assignee: QUALCOMM Incorporated, San Diego, CA, US (QUAL-N)

Inventor: Viterbi, Andrew J., La Jolla, CA, US

Weaver, Jr., Lindsay A., Boulder, CO, US

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Jacobs, Irwin M., La Jolla, CA, US

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Agent: Miller; Russell B.

English; Sean

Language: EN

Application: US 1990543496 A 19900625 (Continuation of application)

US 1992825147 A 19920124 (Continuation of application)

US 1995441894 A 19950516 (Local application)

Related Publication: US 5103459 A (Continuation of patent)

US 5416797 A (Continuation of patent)

Original IPC: H04L-27/30(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-13/00(R,N,M,EP,20060101,20051008,A) H04J-13/00(R,N,M,EP,20060101,20051008,C) H04J-13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-3/02(R,I,M,EP,20060101,20051008,A) H04J-3/02(R,I,M,EP,20060101,20051008,C) H04J-3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/02(R,I,M,EP,20060101,20051008,C) H04L-1/06(R,I,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C)

Original US Class (secondary): 375206 375200 375295 370208 370342 37959 38034 45533.1 45554.1

Original Abstract: An apparatus for communicating variable rate data over a communication channel. A modulator that receive frames of user data each comprised of data symbols. The modulator repeats the data symbols within each frame to maintain a constant data rate. A transmitter receiver the modulator data and scales the modulated symbol data based upon the amount of symbol repetition in the frame.

Claim:

1. Claim 8. In a spread spectrum communication system, an apparatus for transmitting variable rate data, comprising:

- an interleaver having an input and an output, said interleaver converting variable rate symbol data to constant rate symbol data and interleaving said constant rate symbol data;

- a spread spectrum modulator having an input and an output, said modulator input coupled to said interleaver output and said modulator for direct sequence spread spectrum modulating said interleaved constant rate symbol data;
- finite impulse response filter having an input and an output, said filter input coupled to said modulator, said filter energy scaling said modulated symbols by predetermined energy scaling factors to provide an energy scaled signal; and
- a transmitter having an input coupled to said filter output for transmitting said energy scaled signal.

Publication No. US 5943361 A (Update 199941 E)

Publication Date: 19990824

System and method for generating signal waveforms in a CDMA cellular telephone system.

Assignee: Qualcomm Incorporated, San Diego, CA, US (QUAL-N)

Inventor: Gilhousen, Klein S., Bozeman, MT, US

Jacobs, Irwin M., La Jolla, CA, US

Padovani, Roberto, San Diego, CA, US

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Viterbi, Andrew J., La Jolla, CA, US

Weaver, Jr., Lindsay A., Boulder, CO, US

Agent: Miller, Russell B. En

Language: EN

Application: US 1990543496 A 19900625 (Continuation of application)

US 1992825147 A 19920124 (Continuation of application)

US 1995441895 A 19950516 (Local application)

Related Publication: US 5103459 A (Continuation of patent)

US 5416797 A (Continuation of patent)

Original IPC: H04B-15/00(A) H04K-1/00(B) H04L-27/30(B)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C) H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,N,M,EP,20060101,20051008,A) H04J-13/00(R,N,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

3/02(R,I,M,EP,20060101,20051008,A) H04J-3/02(R,I,M,EP,20060101,20051008,C) H04J-

3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-

3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-

1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-

1/02(R,I,M,EP,20060101,20051008,C) H04L-1/06(R,I,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-

5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C)

Original US Class (secondary): 375200 370320 375295

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved,

bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signaling along with QPSK spreading.

Claim:

1. An apparatus for transmitting a plurality of data signals in a spread spectrum communication system, comprising:
 - a plurality of signal generator means for providing a plurality of function signals, each function signal being generated according to a respective function of a plurality of orthogonal functions, wherein the plurality of signal generator means comprises:
 - an outer signal generator for generating an outer function signal;
 - multiple inner signal generators for generating a plurality of inner function signals each inner function signal being generated according to a respective function of said plurality of orthogonal functions;
 - a plurality of spreading means, each spreading means connected to a respective signal generator means and receiving a respective data signal of the plurality of data signals for producing a respective spread spectrum data signal in response to the respective data signal and a respective function signal, wherein each spreading means includes two exclusive-OR gates;
 - a first exclusive-OR gate having two inputs and one output, a first input connected to a respective inner signal generator and a second input receiving a respective data signal of the plurality of data signals; and
 - a second exclusive-OR gate having two inputs and an output, a first input connected to the outer signal generator, a second input connected to the output of the first exclusive-OR gate, and the output connected to a combining means;
 - a pilot signal generator means for generating a pilot signal according to a function which is orthogonal to each function of the plurality of orthogonal functions;
 - said combining means being connected to the plurality of spreading means, wherein said combining means combines a plurality of spread spectrum data signals into a combined spread spectrum data signal; and
 - a transmit means connected to the combining means for amplifying and transmitting the combined spread spectrum data signal.

Publication No. US 6618429 B2 (Update 200361 E)

Publication Date: 20030909

System and method for generating signal waveforms in a CDMA cellular telephone system

Assignee: Qualcomm Incorporated, San Diego, CA, US (QUAL-N)

Inventor: Gilhousen, Klein S., Bozeman, MT, US

Jacobs, Irwin M., La Jolla, CA, US

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Weaver, Jr., Lindsay A., Boulder, CO, US

Wheatley, III, Charles E., Del Mar, CA, US

Viterbi, Andrew J., La Jolla, CA, US

Agent: Miller, Russell B., US

Edwards, Christopher, US

Language: EN

Application: US 1990543496 A 19900625 (Continuation of application)

US 1992825147 A 19920124 (Continuation of application)

US 1995441895 A 19950516 (Continuation of application)

US 1999360059 A 19990723 (Continuation of application)

US 2002263898 A 20021002 (Local application)

Related Publication: US 5103459 A (Continuation of patent)

US 5416797 A (Continuation of patent)

US 5943361 A (Continuation of patent)

Original IPC: H04B-1/69(A)

Current IPC: H04B-1/707(R,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)

H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-

11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-

13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-

3/02(R,I,M,EP,20060101,20051008,A) H04J-3/02(R,I,M,EP,20060101,20051008,C) H04J-

3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-

3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-

1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-

1/02(R,I,M,EP,20060101,20051008,C) H04L-1/06(R,I,M,EP,20060101,20051008,A) H04L-

1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-

23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-

5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-

5/12(R,I,M,EP,20060101,20051008,A) H04L-5/12(R,I,M,EP,20060101,20051008,C) H04L-

Original US Class (secondary): 375141 375140

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signaling along with QPSK spreading.

Claim: We claim:

1. A spread spectrum communication system comprising:

- a plurality of base stations each operable for communication with at least one user unit;
- two receiving systems each for receiving independently a user unit signal transmitted from a user unit as a direct sequence spread spectrum signal within which an information signal is modulated; and
- a diversity combiner coupled to the two receiving system for combining signals received thereby to reconstruct the user unit signal.

Publication No. US 6693951 B1 (Update 200413 E)

Publication Date: 20040217

System and method for generating signal waveforms in a CDMA cellular telephone system

Assignee: Qualcomm Incorporated, San Diego, CA, US (QUAL-N)

Inventor: Gilhousen, Klein S., Bozeman, MT, US

Jacobs, Irwin M., La Jolla, CA, US

Padovani, Roberto, San Diego, CA, US

Weaver, Jr., Lindsay A., Boulder, CO, US
Wheatley, III, Charles E., Del Mar, CA, US
Viterbi, Andrew J., La Jolla, CA, US
Agent: Miller, Russell B., US
Edwards, Christopher, US
Language: EN

Application: US 1990543496 A 19900625 (Continuation of application)

US 1992825147 A 19920124 (Continuation of application)

US 1995441895 A 19950516 (Continuation of application)

US 1999360059 A 19990723 (Local application)

Related Publication: US 5103459 A (Continuation of patent)

US 5416797 A (Continuation of patent)

US 5943361 A (Continuation of patent)

Original IPC: H04B-1/69(A)

Current IPC: H04B-1/707(R,A,I,M,EP,20060101,20051008,A) H04B-1/707(R,I,M,EP,20060101,20051008,C)
H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-
7/26(R,I,M,EP,20060101,20051008,A) H04B-7/26(R,I,M,EP,20060101,20051008,C) H04J-
11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-
13/00(R,I,M,EP,20060101,20051008,A) H04J-13/00(R,I,M,EP,20060101,20051008,C) H04J-
13/02(R,I,M,EP,20060101,20051008,A) H04J-13/02(R,I,M,EP,20060101,20051008,C) H04J-
3/02(R,I,M,EP,20060101,20051008,A) H04J-3/02(R,I,M,EP,20060101,20051008,C) H04J-
3/16(R,I,M,EP,20060101,20051008,A) H04J-3/16(R,I,M,EP,20060101,20051008,C) H04J-
3/22(R,I,M,EP,20060101,20051008,A) H04J-3/22(R,I,M,EP,20060101,20051008,C) H04L-
1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-
1/02(R,I,M,EP,20060101,20051008,C) H04L-1/06(R,I,M,EP,20060101,20051008,A) H04L-
1/08(R,N,M,EP,20060101,20051008,A) H04L-1/08(R,N,M,EP,20060101,20051008,C) H04L-
23/00(R,I,M,EP,20060101,20051008,C) H04L-23/02(R,I,M,EP,20060101,20051008,A) H04L-
5/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,C) H04L-
5/12(R,I,M,EP,20060101,20051008,A)

Original US Class (secondary): 375130

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned; with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signaling along with QPSK spreading.

Claim: We claim:

1. A spread-spectrum signal receiver comprising:

- a Walsh sequence generator for generating a Walsh sequence assigned to the receiver;
- a correlator coupled to the Walsh sequence generator and configured to produce a despread signal for the receiver by correlating the generated Walsh sequence and a received spread-spectrum signal; and

- a phase rotator coupled to an accumulator for receiving the accumulated signal therefrom, and wherein the despread signal comprises a pilot signal having a phase and the phase rotator is configured to rotate the accumulated signal to the phase of the pilot signal.

Publication No. US 7003021 B2 (Update 200615 E)

Publication Date: 20060221

System and method for generating signal waveforms in a CDMA cellular telephone system

Assignee: Qualcomm Incorporated, San Diego, CA, US (QUAL-N)

Gilhousen, Klein S., Bozeman, MT, US Residence: US

Jacobs, Irwin M., La Jolla, CA, US Residence: US

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US 1992825147 A 19920124 (Continuation of application)

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US 1999360059 A 19990723 (Division of application)

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US 5416797 A (Continuation of patent)

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Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site and mobile units using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signaling along with QPSK spreading.

Claim: We claim:

1. A spread-spectrum signal receiver comprising:

- a PN sequence generator for generating a PN sequence;
- a correlator coupled to the PN sequence generator and configured to produce a despread signal comprising a pilot signal by correlating the generated PN sequence and a received spread-spectrum signal; and
- processing circuitry coupled to the correlator for processing the despread signal to extract time information from the pilot signal.

WIPO

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SYSTEM AND METHOD FOR GENERATING SIGNAL WAVEFORMS IN A CDMA CELLULAR TELEPHONE SYSTEM

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11/00(R,I,M,EP,20060101,20051008,A) H04J-11/00(R,I,M,EP,20060101,20051008,C) H04J-

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23/02(R,I,M,EP,20060101,20051008,A) H04L-5/02(R,I,M,EP,20060101,20051008,A) H04L-

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7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)

Original Abstract: A system and method for communicating information signals using spread spectrum communication techniques. PN sequences are constructed that provide orthogonality between the users so that mutual interference will be reduced, allowing higher capacity and better link performance. With orthogonal PN codes, the cross-correlation is zero over a predetermined time interval, resulting in no interference between the orthogonal codes, provided only that the code time frames are time aligned with each other. In an exemplary embodiment, signals are communicated between a cell-site (12, 14) and mobile units (16, 18) using direct sequence spread spectrum communication signals. In the cell-to-mobile link, pilot, sync, paging and voice channels are defined. Information communicated on the cell-to-mobile link channels are, in general, encoded, interleaved, bi-phase shift key (BPSK) modulated with orthogonal covering of each BPSK symbol

along with quadrature phase shift key (QPSK) spreading of the covered symbols. In the mobile-to-cell link, access and voice channels are defined. Information communicated on the mobile-to-cell link channels are, in general, encoded, interleaved, orthogonal signalling along with QPSK spreading.

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H04B-7/005(R,N,M,EP,20060101,20051008,A) H04B-7/005(R,N,M,EP,20060101,20051008,C) H04B-

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3/22(R,I,M,EP,20060101,20051008,C) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/08(R,N,M,EP,20060101,20051008,A) H04L-

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7/38(R,I,M,JP,20060101,20051220,A,F) H04Q-7/38(R,I,M,JP,20060101,20051220,C,F)